

What is claimed is:

1. An image processing device for creating, based on a drawing command, drawing data to be used for forming an image while scanning in a main scanning direction, the image processing device comprising:

storage means prestored with a predetermined first reference value;

command receiving means for receiving drawing commands in succession;

graphic determination means for determining whether or not a graphic pattern to be drawn by each drawing command has a predetermined shape;

graphic width determination means for determining, when the graphic determination means determines that the graphic pattern has the predetermined shape, whether or not a width of the graphic pattern in a main scanning direction is less than or equal to the first reference value;

graphic pattern determination means for holding the drawing command when the graphic width determination means determines that the width of the corresponding graphic pattern is less than or equal to the first reference value, and, determining, when the graphic pattern determination means holds a plurality of drawing commands, whether or not the graphic patterns indicated by the plurality of drawing

commands constitute an array pattern, in which the corresponding graphic patterns are arranged consecutively in the main scanning direction;

5 command conversion means for converting, when the graphic pattern determination means determines that the plurality of graphic patterns indicated by the plurality of drawing commands constitute the array pattern, the plurality of drawing commands into one or more secondary drawing command to draw one or more secondary graphic pattern, the one or more secondary graphic pattern being
10 defined by combining the plurality of graphic patterns together in the main scanning direction; and

 drawing data generation means for generating, based on the one or more secondary drawing command, drawing data to
15 be used for forming the one or more secondary graphic pattern while scanning in the main scanning direction.

2. The image processing device as claimed in claim 1, wherein the command conversion means converts, when the graphic pattern determination means determines that the
20 plurality of graphic patterns constitute the array pattern, the plurality of drawing commands into the one or more secondary drawing command to draw the one or more secondary graphic pattern, each secondary drawing command being for drawing a corresponding secondary graphic pattern by

repeatedly drawing, in an auxiliary scanning direction, a predetermined number of scan line that extends in the main scanning direction, the auxiliary scanning direction extending substantially perpendicularly to the main scanning direction.

3. The image processing device as claimed in claim 1, further comprising a memory for storing the drawing data, wherein the drawing data generation means generates the drawing data and transfers the generated drawing data between the drawing data generation means and the memory in a transfer condition, the first reference value being previously determined dependently on the transfer condition.

4. The image processing device as claimed in claim 1, wherein the predetermined shape is a rectangle.

5. The image processing device as claimed in claim 1, further comprising image forming means for forming an image on a recording medium based on the drawing data while scanning in the main scanning direction.

6. The image processing device as claimed in claim 1, wherein the storage means is also prestored with a predetermined second reference value that is greater than the first reference value, and

wherein each secondary graphic pattern has a width in the main scanning direction that is larger than the first

reference value and that is smaller than or equal to the second reference value.

7. The image processing device as claimed in claim 6, further comprising a memory for storing the drawing data, wherein the drawing data generation means generates the drawing data and transfers the generated drawing data between the drawing data generation means and the memory in a transfer condition, the first reference value and the second reference value being previously determined dependently on the transfer condition.

8. The image processing device as claimed in claim 1, wherein when the graphic pattern determination means determines that the plurality of graphic patterns indicated by the plurality of drawing commands fail to constitute an array pattern, the command conversion means fails to convert the plurality of drawing commands, and

further comprising:

a main storage device having an intermediate drawing command storage area and a drawing data storage area, the intermediate drawing command storage area being for storing, as intermediate drawing commands, the secondary drawing command that is produced by the command conversion means when the command conversion means converts the drawing commands into the secondary drawing command, and the

drawing command when the command conversion means fails to convert the drawing command, the drawing data storage area being for storing the drawing data produced by the drawing data generation means.

5 9. The image processing device as claimed in claim 8, further comprising a cache memory, the drawing data generation means generating the drawing data while transferring the generated drawing data between the cache memory and the drawing data storage area.

10 10. The image processing device as claimed in claim 9, wherein the drawing data storage area has a plurality of record areas, and the cache memory has several record areas, each record area in the drawing data storage area having a record length equal to that of each record area in the
15 cache memory, data transfer being executed between the main storage device and the cache memory by successive data units, each data unit having a data amount corresponding to the record length, the first reference value being previously determined dependently on a data amount
20 corresponding to the record length.

 11. The image processing device as claimed in claim 10,

 wherein the storage means is also prestored with a predetermined second reference value that is greater than

the first reference value, and

wherein each secondary graphic pattern has a width in the main scanning direction that is larger than the first reference value and that is smaller than or equal to the second reference value, the second reference value being
5 smaller than or equal to a width corresponding to the record length.

12. The image processing device as claimed in claim 9, wherein the cache memory has a data capacity, the first
10 reference value being previously determined dependently on a data amount corresponding to the data capacity.

13. The image processing device as claimed in claim 12,

wherein the storage means is also prestored with a
15 predetermined second reference value that is greater than the first reference value, and

wherein each secondary graphic pattern has a width in the main scanning direction that is larger than the first reference value and that is smaller than or equal to the
20 second reference value, the second reference value being smaller than or equal to a width corresponding to the data capacity.

14. The image processing device as claimed in claim 8, wherein the drawing data generation means accesses each

storage portion in the drawing data storage area of the main storage device by designating a row address and a column address of the each storage portion, the drawing data generation means successively accessing storage portions in one page's worth of storage area with a single row address in the drawing data storage area by successively designating column addresses without addressing the corresponding row address, and

wherein the first reference value is previously determined dependently on a data amount corresponding to a length of the one page's worth of storage area.

15. The image processing device as claimed in claim 14,

wherein the storage means is also prestored with a predetermined second reference value that is greater than the first reference value, and

wherein each secondary graphic pattern has a width in the main scanning direction that is larger than the first reference value and that is smaller than or equal to the second reference value, the second reference value being smaller than or equal to a width corresponding to the length of the one page's worth of storage area.

16. The image processing device as claimed in claim 8, wherein the drawing data generation means accesses each

storage portion in the drawing data storage area of the main storage device by designating a row address and a column address of the each storage portion, the drawing data generation means accessing, during a burst mode, a plurality of successive storage portions having a single row address by designating a single column address once, the plurality of successive storage portions being defined in a storage area having one burst length, and

wherein the first reference value is previously determined dependently on a data amount corresponding to the one burst length.

17. The image processing device as claimed in claim 16,

wherein the storage means is also prestored with a predetermined second reference value that is greater than the first reference value, and

wherein each secondary graphic pattern has a width in the main scanning direction that is larger than the first reference value and that is smaller than or equal to the second reference value, the second reference value being smaller than or equal to a width corresponding to the one burst length.

18. The image processing device as claimed in claim 8, further comprising a data bus connected between the drawing data generation means and the main storage device,

and

wherein the first reference value is previously determined dependently on a width of the data bus.

19. The image processing device as claimed in claim
5 18,

wherein the storage means is also prestored with a predetermined second reference value that is greater than the first reference value, and

wherein each secondary graphic pattern has a width in
10 the main scanning direction that is larger than the first reference value and that is smaller than or equal to the second reference value, the second reference value being smaller than or equal to a width corresponding to the width of the data bus.

20. An image processing device for creating, based on
15 a drawing command, drawing data to be used for forming an image while scanning in a main scanning direction, the image processing device comprising:

a storage portion prestored with a predetermined first
20 reference value;

a memory; and

a controller that receives drawing commands in succession, that determines whether or not a graphic pattern to be drawn by each drawing command has a

predetermined shape, that determines, when the graphic pattern has the predetermined shape, whether or not a width of the graphic pattern in a main scanning direction is less than or equal to the first reference value, that holds in the memory the drawing command when the width of the corresponding graphic pattern is less than or equal to the first reference value, that determines, when a plurality of drawing commands are held in the memory, whether or not the graphic patterns indicated by the plurality of drawing commands constitute an array pattern, in which the corresponding graphic patterns are arranged consecutively in the main scanning direction, that converts, when the plurality of graphic patterns indicated by the plurality of drawing commands constitute the array pattern, the plurality of drawing commands into one or more secondary drawing command to draw one or more secondary graphic pattern, the one or more secondary graphic pattern being defined by combining the plurality of graphic patterns together in the main scanning direction, and that generates, based on the one or more secondary drawing command, drawing data to be used for forming the one or more secondary graphic pattern while scanning in the main scanning direction.

21. The image processing device as claimed in claim

20, wherein the controller generates the drawing data while transferring the generated drawing data between the controller and the memory in a transfer condition, the first reference value being previously determined dependently on the transfer condition.

22. The image processing device as claimed in claim 21, wherein the storage portion is also prestored with a predetermined second reference value that is greater than the first reference value,

wherein each secondary graphic pattern has a width in the main scanning direction that is larger than the first reference value and that is smaller than or equal to the second reference value,

wherein the second reference value is previously determined dependently on the transfer condition.